SEQUENCE LISTING

<110> Frank, Markus

Sayegh, Mohamed

<120> A Gene Encoding a Multidrug Resistance Human P-Glycoprotein Homologue on Chromosome 7p15-21 and Uses Thereof

<130> 81994/268611

<160> 19

<170> PatentIn version 3.0

<210> 1

<211> 659

<212> PRT

<213> Homo sapiens

<400> 1

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Met Leu Ala Glu Lys Gly Ala His Ala Glu Leu Met Ala Lys Arg Gly
1               5                  10                  15

Leu Tyr Tyr Ser Leu Val Met Ser Gln Asp Ile Lys Lys Ala Asp Glu
            20                  25                  30

Gln Met Glu Ser Met Thr Tyr Ser Thr Glu Arg Lys Thr Asn Ser Leu
        35                  40                  45

Pro Leu His Ser Val Lys Ser Ile Lys Ser Asp Phe Ile Asp Lys Ala
    50                  55                  60

Glu Glu Ser Thr Gln Ser Lys Glu Ile Ser Leu Pro Glu Val Ser Leu
65                  70                  75                  80

Leu Lys Ile Leu Lys Leu Asn Lys Pro Glu Trp Pro Phe Val Val Leu
                85                  90                  95

Gly Thr Leu Ala Ser Val Leu Asn Gly Thr Val His Pro Val Phe Ser
            100                 105                 110

Ile Ile Phe Ala Lys Ile Ile Thr Met Phe Gly Asn Asn Asp Lys Thr
        115                 120                 125

Thr Leu Lys His Asp Ala Glu Ile Tyr Ser Met Ile Phe Val Ile Leu
    130                 135                 140

Gly Val Ile Cys Phe Val Ser Tyr Phe Met Gln Gly Leu Phe Tyr Gly
145                 150                 155                 160
```

```
Arg Ala Gly Glu Ile Leu Thr Met Arg Leu Arg His Leu Ala Phe Lys
                165                 170                 175

Ala Met Leu Tyr Gln Asp Ile Ala Trp Phe Asp Glu Lys Glu Asn Ser
            180                 185                 190

Thr Gly Gly Leu Thr Thr Ile Leu Ala Ile Asp Ile Ala Gln Ile Gln
        195                 200                 205

Gly Ala Thr Gly Ser Arg Ile Gly Val Leu Thr Gln Asn Ala Thr Asn
    210                 215                 220

Met Gly Leu Ser Val Ile Ile Ser Phe Ile Tyr Gly Trp Glu Met Thr
225                 230                 235                 240

Phe Leu Ile Leu Ser Ile Ala Pro Val Leu Ala Val Thr Gly Met Ile
                245                 250                 255

Glu Thr Ala Ala Met Thr Gly Phe Ala Asn Lys Asp Lys Gln Glu Leu
            260                 265                 270

Lys His Ala Gly Lys Ile Ala Thr Glu Ala Leu Glu Asn Ile Arg Thr
        275                 280                 285

Ile Val Ser Leu Thr Arg Glu Lys Ala Phe Glu Gln Met Tyr Glu Glu
    290                 295                 300

Met Leu Gln Thr Gln His Arg Asn Thr Ser Lys Lys Ala Gln Ile Ile
305                 310                 315                 320

Gly Ser Cys Tyr Ala Phe Ser His Ala Phe Ile Tyr Phe Ala Tyr Ala
                325                 330                 335

Ala Gly Phe Arg Phe Gly Ala Tyr Leu Ile Gln Ala Gly Arg Met Thr
            340                 345                 350

Pro Glu Gly Met Phe Ile Val Phe Thr Ala Ile Ala Tyr Gly Ala Met
        355                 360                 365

Ala Ile Gly Lys Thr Leu Val Leu Ala Pro Glu Tyr Ser Lys Ala Lys
    370                 375                 380

Ser Gly Ala Ala His Leu Phe Ala Leu Leu Glu Lys Lys Pro Asn Ile
385                 390                 395                 400

Asp Ser Arg Ser Gln Glu Gly Lys Lys Pro Asp Thr Cys Glu Gly Asn
                405                 410                 415

Leu Glu Phe Arg Glu Val Ser Phe Phe Tyr Pro Cys Arg Pro Asp Val
            420                 425                 430

Phe Ile Leu Arg Gly Leu Ser Leu Ser Ile Glu Arg Gly Lys Thr Val
        435                 440                 445

Ala Phe Val Gly Ser Ser Gly Cys Gly Lys Ser Thr Ser Val Gln Leu
    450                 455                 460

Leu Gln Arg Leu Tyr Asp Pro Val Gln Gly Gln Val Leu Phe Asp Gly
465                 470                 475                 480

Val Asp Ala Lys Glu Leu Asn Val Gln Trp Leu Arg Ser Gln Ile Ala
                485                 490                 495
```

Ile Val Pro Gln Glu Pro Val Leu Phe Asn Cys Ser Ile Ala Glu Asn
500 505 510

Ile Ala Tyr Gly Asp Asn Ser Arg Val Val Pro Leu Asp Glu Ile Lys
515 520 525

Glu Ala Ala Asn Ala Ala Asn Ile His Ser Phe Ile Glu Gly Leu Pro
530 535 540

Glu Lys Tyr Asn Thr Gln Val Gly Leu Lys Gly Ala Gln Leu Ser Gly
545 550 555 560

Gly Gln Lys Gln Arg Leu Ala Ile Ala Arg Ala Leu Leu Gln Lys Pro
565 570 575

Lys Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Asn Asp Ser
580 585 590

Glu Lys Val Val Gln His Ala Leu Asp Lys Ala Arg Thr Gly Arg Thr
595 600 605

Cys Leu Val Val Thr His Arg Leu Ser Ala Ile Gln Asn Ala Asp Leu
610 615 620

Ile Val Val Leu His Asn Gly Lys Ile Lys Glu Gln Gly Thr His Gln
625 630 635 640

Glu Leu Leu Arg Asn Arg Asp Ile Tyr Phe Lys Leu Val Asn Ala Gln
645 650 655

Ser Val Gln

<210> 2

<211> 812

<212> PRT

<213> Homo sapiens

<400> 2

Met Val Asp Glu Asn Asp Ile Arg Ala Leu Asn Val Arg His Tyr Arg
1 5 10 15

Asp His Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Gly Thr Thr
20 25 30

Ile Ser Asn Asn Ile Lys Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu
35 40 45

Met Glu Arg Ala Ala Arg Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu
50 55 60

Phe Pro Asn Lys Phe Asn Thr Leu Val Gly Glu Lys Gly Ala Gln Met
65 70 75 80

Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg
85 90 95

```
Asn Pro Lys Ile Leu Ile Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser
            100                 105                 110

Glu Ser Lys Ser Ala Val Gln Ala Ala Leu Glu Lys Ala Ser Lys Gly
        115                 120                 125

Arg Thr Thr Ile Val Val Ala His Arg Leu Ser Thr Ile Arg Ser Ala
    130                 135                 140

Asp Leu Ile Val Thr Leu Lys Asp Gly Met Leu Ala Glu Lys Gly Ala
145                 150                 155                 160

His Ala Glu Leu Met Ala Lys Arg Gly Leu Tyr Tyr Ser Leu Val Met
                165                 170                 175

Ser Gln Asp Ile Lys Lys Ala Asp Glu Gln Met Glu Ser Met Thr Tyr
            180                 185                 190

Ser Thr Glu Arg Lys Thr Asn Ser Leu Pro Leu His Ser Val Lys Ser
        195                 200                 205

Ile Lys Ser Asp Phe Ile Asp Lys Ala Glu Glu Ser Thr Gln Ser Lys
    210                 215                 220

Glu Ile Ser Leu Pro Glu Val Ser Leu Leu Lys Ile Leu Lys Leu Asn
225                 230                 235                 240

Lys Pro Glu Trp Pro Phe Val Val Leu Gly Thr Leu Ala Ser Val Leu
                245                 250                 255

Asn Gly Thr Val His Pro Val Phe Ser Ile Ile Phe Ala Lys Ile Ile
            260                 265                 270

Thr Met Phe Gly Asn Asn Asp Lys Thr Thr Leu Lys His Asp Ala Glu
        275                 280                 285

Ile Tyr Ser Met Ile Phe Val Ile Leu Gly Val Ile Cys Phe Val Ser
    290                 295                 300

Tyr Phe Met Gln Gly Leu Phe Tyr Gly Arg Ala Gly Glu Ile Leu Thr
305                 310                 315                 320

Met Arg Leu Arg His Leu Ala Phe Lys Ala Met Leu Tyr Gln Asp Ile
                325                 330                 335

Ala Trp Phe Asp Glu Lys Glu Asn Ser Thr Gly Gly Leu Thr Thr Ile
            340                 345                 350

Leu Ala Ile Asp Ile Ala Gln Ile Gln Gly Ala Thr Gly Ser Arg Ile
        355                 360                 365

Gly Val Leu Thr Gln Asn Ala Thr Asn Met Gly Leu Ser Val Ile Ile
    370                 375                 380

Ser Phe Ile Tyr Gly Trp Glu Met Thr Phe Leu Ile Leu Ser Ile Ala
385                 390                 395                 400

Pro Val Leu Ala Val Thr Gly Met Ile Glu Thr Ala Ala Met Thr Gly
                405                 410                 415

Phe Ala Asn Lys Asp Lys Gln Glu Leu Lys His Ala Gly Lys Ile Ala
            420                 425                 430
```

```
Thr Glu Ala Leu Glu Asn Ile Arg Thr Ile Val Ser Leu Thr Arg Glu
        435                 440                 445

Lys Ala Phe Glu Gln Met Tyr Glu Glu Met Leu Gln Thr Gln His Arg
    450                 455                 460

Asn Thr Ser Lys Lys Ala Gln Ile Ile Gly Ser Cys Tyr Ala Phe Ser
465                 470                 475                 480

His Ala Phe Ile Tyr Phe Ala Tyr Ala Ala Gly Phe Arg Phe Gly Ala
                485                 490                 495

Tyr Leu Ile Gln Ala Gly Arg Met Thr Pro Glu Gly Met Phe Ile Val
            500                 505                 510

Phe Thr Ala Ile Ala Tyr Gly Ala Met Ala Ile Gly Lys Thr Leu Val
        515                 520                 525

Leu Ala Pro Glu Tyr Ser Lys Ala Lys Ser Gly Ala Ala His Leu Phe
    530                 535                 540

Ala Leu Leu Glu Lys Lys Pro Asn Ile Asp Ser Arg Ser Gln Glu Gly
545                 550                 555                 560

Lys Lys Pro Asp Thr Cys Glu Gly Asn Leu Glu Phe Arg Glu Val Ser
                565                 570                 575

Phe Phe Tyr Pro Cys Arg Pro Asp Val Phe Ile Leu Arg Gly Leu Ser
            580                 585                 590

Leu Ser Ile Glu Arg Gly Lys Thr Val Ala Phe Val Gly Ser Ser Gly
        595                 600                 605

Cys Gly Lys Ser Thr Ser Val Gln Leu Leu Gln Arg Leu Tyr Asp Pro
    610                 615                 620

Val Gln Gly Gln Val Leu Phe Asp Gly Val Asp Ala Lys Glu Leu Asn
625                 630                 635                 640

Val Gln Trp Leu Arg Ser Gln Ile Ala Ile Val Pro Gln Glu Pro Val
                645                 650                 655

Leu Phe Asn Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly Asp Asn Ser
            660                 665                 670

Arg Val Val Pro Leu Asp Glu Ile Lys Glu Ala Ala Asn Ala Ala Asn
        675                 680                 685

Ile His Ser Phe Ile Glu Gly Leu Pro Glu Lys Tyr Asn Thr Gln Val
    690                 695                 700

Gly Leu Lys Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg Leu Ala
705                 710                 715                 720

Ile Ala Arg Ala Leu Leu Gln Lys Pro Lys Ile Leu Leu Leu Asp Glu
                725                 730                 735

Ala Thr Ser Ala Leu Asp Asn Asp Ser Glu Lys Val Val Gln His Ala
            740                 745                 750

Leu Asp Lys Ala Arg Thr Gly Arg Thr Cys Leu Val Val Thr His Arg
        755                 760                 765
```

```
Leu Ser Ala Ile Gln Asn Ala Asp Leu Ile Val Val Leu His Asn Gly
    770                 775                 780

Lys Ile Lys Glu Gln Gly Thr His Gln Glu Leu Leu Arg Asn Arg Asp
785                 790                 795                 800

Ile Tyr Phe Lys Leu Val Asn Ala Gln Ser Val Gln
                805                 810
```

<210> 3

<211> 131

<212> PRT

<213> Homo sapiens

<400> 3

```
Met Val Asp Glu Asn Asp Ile Arg Ala Leu Asn Val Arg His Tyr Arg
1               5                   10                  15

Asp His Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Gly Thr Thr
            20                  25                  30

Ile Ser Asn Asn Ile Lys Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu
        35                  40                  45

Met Glu Arg Ala Ala Arg Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu
    50                  55                  60

Phe Pro Asn Lys Phe Asn Thr Leu Val Gly Glu Lys Gly Ala Gln Met
65                  70                  75                  80

Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg
                85                  90                  95

Asn Pro Lys Ile Leu Ile Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser
            100                 105                 110

Glu Ser Lys Ser Ala Val Gln Ala Ala Leu Glu Lys Asp Thr Pro Arg
        115                 120                 125

Tyr Ser Phe
    130
```

<210> 4

<211> 1058

<212> PRT

<213> Homo sapiens

<220>

<221> Note

<222> (66)..(66)

<223> Xaa at position 66 represents any L amino acid

<400> 4

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Met Val Ile Ser Leu Thr Ser Lys Glu Leu Ser Ala Tyr Ser Lys Ala
1               5                   10                  15

Gly Ala Val Ala Glu Glu Val Leu Ser Ser Ile Arg Thr Val Ile Ala
            20                  25                  30

Phe Arg Ala Gln Glu Lys Glu Leu Gln Arg Ser Phe Leu Leu Asn Ile
        35                  40                  45

Thr Arg Tyr Ala Trp Phe Tyr Phe Pro Gln Trp Leu Leu Ser Cys Val
    50                  55                  60

Leu Xaa Phe Val Arg Tyr Thr Gln Asn Leu Lys Asp Ala Lys Asp Phe
65                  70                  75                  80

Gly Ile Lys Arg Thr Ile Ala Ser Lys Val Ser Leu Gly Ala Val Tyr
                85                  90                  95

Phe Phe Met Asn Gly Thr Tyr Gly Leu Ala Phe Trp Tyr Gly Thr Ser
            100                 105                 110

Leu Ile Leu Asn Gly Glu Pro Gly Tyr Thr Ile Gly Thr Val Leu Ala
        115                 120                 125

Val Phe Phe Ser Val Ile His Ser Ser Tyr Cys Ile Gly Ala Ala Val
    130                 135                 140

Pro His Phe Glu Thr Phe Ala Ile Ala Arg Gly Ala Ala Phe His Ile
145                 150                 155                 160

Phe Gln Val Ile Asp Lys Lys Pro Ser Ile Asp Asn Phe Ser Thr Ala
                165                 170                 175

Gly Tyr Lys Pro Glu Ser Ile Glu Gly Thr Val Glu Phe Lys Asn Val
            180                 185                 190

Ser Phe Asn Tyr Pro Ser Arg Pro Ser Ile Lys Ile Leu Lys Gly Leu
        195                 200                 205

Asn Leu Arg Ile Lys Ser Gly Glu Thr Val Ala Leu Val Gly Leu Asn
    210                 215                 220

Gly Ser Gly Lys Ser Thr Val Val Gln Leu Leu Gln Arg Leu Tyr Asp
225                 230                 235                 240

Pro Asp Asp Gly Phe Ile Met Val Asp Glu Asn Asp Ile Arg Ala Leu
                245                 250                 255

Asn Val Arg His Tyr Arg Asp His Ile Gly Val Val Ser Gln Glu Pro
            260                 265                 270

Val Leu Phe Gly Thr Thr Ile Ser Asn Asn Ile Lys Tyr Gly Arg Asp
        275                 280                 285

Asp Val Thr Asp Glu Glu Met Glu Arg Ala Ala Arg Glu Ala Asn Ala
    290                 295                 300
```

Tyr Asp Phe Ile Met Glu Phe Pro Asn Lys Phe Asn Thr Leu Val Gly
305   310   315   320

Glu Lys Gly Ala Gln Met Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile
                325   330   335

Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Ile Leu Asp Glu Ala
            340   345   350

Thr Ser Ala Leu Asp Ser Glu Ser Lys Ser Ala Val Gln Ala Ala Leu
        355   360   365

Glu Lys Ala Ser Lys Gly Arg Thr Thr Ile Val Val Ala His Arg Leu
    370   375   380

Ser Thr Ile Arg Ser Ala Asp Leu Ile Val Thr Leu Lys Asp Gly Met
385   390   395   400

Leu Ala Glu Lys Gly Ala His Ala Glu Leu Met Ala Lys Arg Gly Leu
                405   410   415

Tyr Tyr Ser Leu Val Met Ser Gln Asp Ile Lys Lys Ala Asp Glu Gln
            420   425   430

Met Glu Ser Met Thr Tyr Ser Thr Glu Arg Lys Thr Asn Ser Leu Pro
        435   440   445

Leu His Ser Val Lys Ser Ile Lys Ser Asp Phe Ile Asp Lys Ala Glu
    450   455   460

Glu Ser Thr Gln Ser Lys Glu Ile Ser Leu Pro Glu Val Ser Leu Leu
465   470   475   480

Lys Ile Leu Lys Leu Asn Lys Pro Glu Trp Pro Phe Val Val Leu Gly
                485   490   495

Thr Leu Ala Ser Val Leu Asn Gly Thr Val His Pro Val Phe Ser Ile
            500   505   510

Ile Phe Ala Lys Ile Ile Thr Met Phe Gly Asn Asn Asp Lys Thr Thr
        515   520   525

Leu Lys His Asp Ala Glu Ile Tyr Ser Met Ile Phe Val Ile Leu Gly
    530   535   540

Val Ile Cys Phe Val Ser Tyr Phe Met Gln Gly Leu Phe Tyr Gly Arg
545   550   555   560

Ala Gly Glu Ile Leu Thr Met Arg Leu Arg His Leu Ala Phe Lys Ala
                565   570   575

Met Leu Tyr Gln Asp Ile Ala Trp Phe Asp Glu Lys Glu Asn Ser Thr
            580   585   590

Gly Gly Leu Thr Thr Ile Leu Ala Ile Asp Ile Ala Gln Ile Gln Gly
        595   600   605

Ala Thr Gly Ser Arg Ile Gly Val Leu Thr Gln Asn Ala Thr Asn Met
    610   615   620

Gly Leu Ser Val Ile Ile Ser Phe Ile Tyr Gly Trp Glu Met Thr Phe
625   630   635   640

Leu Ile Leu Ser Ile Ala Pro Val Leu Ala Val Thr Gly Met Ile Glu
645 650 655

Thr Ala Ala Met Thr Gly Phe Ala Asn Lys Asp Lys Gln Glu Leu Lys
660 665 670

His Ala Gly Lys Ile Ala Thr Glu Ala Leu Glu Asn Ile Arg Thr Ile
675 680 685

Val Ser Leu Thr Arg Glu Lys Ala Phe Glu Gln Met Tyr Glu Glu Met
690 695 700

Leu Gln Thr Gln His Arg Asn Thr Ser Lys Lys Ala Gln Ile Ile Gly
705 710 715 720

Ser Cys Tyr Ala Phe Ser His Ala Phe Ile Tyr Phe Ala Tyr Ala Ala
725 730 735

Gly Phe Arg Phe Gly Ala Tyr Leu Ile Gln Ala Gly Arg Met Thr Pro
740 745 750

Glu Gly Met Phe Ile Val Phe Thr Ala Ile Ala Tyr Gly Ala Met Ala
755 760 765

Ile Gly Lys Thr Leu Val Leu Ala Pro Glu Tyr Ser Lys Ala Lys Ser
770 775 780

Gly Ala Ala His Leu Phe Ala Leu Leu Glu Lys Lys Pro Asn Ile Asp
785 790 795 800

Ser Arg Ser Gln Glu Gly Lys Lys Pro Asp Thr Cys Glu Gly Asn Leu
805 810 815

Glu Phe Arg Glu Val Ser Phe Phe Tyr Pro Cys Arg Pro Asp Val Phe
820 825 830

Ile Leu Arg Gly Leu Ser Leu Ser Ile Glu Arg Gly Lys Thr Val Ala
835 840 845

Phe Val Gly Ser Ser Gly Cys Gly Lys Ser Thr Ser Val Gln Leu Leu
850 855 860

Gln Arg Leu Tyr Asp Pro Val Gln Gly Gln Val Leu Phe Asp Gly Val
865 870 875 880

Asp Ala Lys Glu Leu Asn Val Gln Trp Leu Arg Ser Gln Ile Ala Ile
885 890 895

Val Pro Gln Glu Pro Val Leu Phe Asn Cys Ser Ile Ala Glu Asn Ile
900 905 910

Ala Tyr Gly Asp Asn Ser Arg Val Val Pro Leu Asp Glu Ile Lys Glu
915 920 925

Ala Ala Asn Ala Ala Asn Ile His Ser Phe Ile Glu Gly Leu Pro Glu
930 935 940

Lys Tyr Asn Thr Gln Val Gly Leu Lys Gly Ala Gln Leu Ser Gly Gly
945 950 955 960

Gln Lys Gln Arg Leu Ala Ile Ala Arg Ala Leu Leu Gln Lys Pro Lys
965 970 975

```
Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Asn Asp Ser Glu
            980                 985                 990

Lys Val Val Gln His Ala Leu Asp  Lys Ala Arg Thr Gly  Arg Thr Cys
        995                 1000                1005

Leu Val  Val Thr His Arg Leu  Ser Ala Ile Gln Asn  Ala Asp Leu
    1010                1015                1020

Ile Val  Val Leu His Asn Gly  Lys Ile Lys Glu Gln  Gly Thr His
    1025                1030                1035

Gln Glu  Leu Leu Arg Asn Arg  Asp Ile Tyr Phe Lys  Leu Val Asn
    1040                1045                1050

Ala Gln  Ser Val Gln
    1055
```

<210> 5

<211> 1222

<212> PRT

<213> Homo sapiens

<220>

<221> Note

<222> (230)..(230)

<223> Xaa at position 230 represents any L amino acid

<400> 5

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Met Ile Leu Gly Ile Leu Ala Ser Leu Val Asn Gly Ala Cys Leu Pro
1               5                   10                  15

Leu Met Pro Leu Val Leu Gly Glu Met Ser Asp Asn Leu Ile Ser Gly
            20                  25                  30

Cys Leu Val Gln Thr Asn Thr Tyr Ser Phe Phe Arg Leu Thr Leu Tyr
        35                  40                  45

Tyr Val Gly Ile Gly Val Ala Ala Leu Ile Phe Gly Tyr Ile Gln Ile
    50                  55                  60

Ser Leu Trp Ile Ile Thr Ala Ala Arg Gln Thr Lys Arg Ile Arg Lys
65                  70                  75                  80

Gln Phe Phe His Ser Val Leu Ala Gln Asp Ile Gly Trp Phe Asp Ser
                85                  90                  95

Cys Asp Ile Gly Glu Leu Asn Thr Arg Met Thr Asp Ile Asp Lys Ile
            100                 105                 110

Ser Asp Gly Ile Gly Asp Lys Ile Ala Leu Leu Phe Gln Asn Met Ser
        115                 120                 125
```

```
Thr Phe Ser Ile Gly Leu Ala Val Gly Leu Val Lys Gly Trp Lys Leu
    130                 135                 140

Thr Leu Val Thr Leu Ser Thr Ser Pro Leu Ile Met Ala Ser Ala Ala
145                 150                 155                 160

Ala Cys Ser Arg Met Val Ile Ser Leu Thr Ser Lys Glu Leu Ser Ala
                165                 170                 175

Tyr Ser Lys Ala Gly Ala Val Ala Glu Glu Val Leu Ser Ser Ile Arg
            180                 185                 190

Thr Val Ile Ala Phe Arg Ala Gln Glu Lys Glu Leu Gln Arg Ser Phe
        195                 200                 205

Leu Leu Asn Ile Thr Arg Tyr Ala Trp Phe Tyr Phe Pro Gln Trp Leu
    210                 215                 220

Leu Ser Cys Val Leu Xaa Phe Val Arg Tyr Thr Gln Asn Leu Lys Asp
225                 230                 235                 240

Ala Lys Asp Phe Gly Ile Lys Arg Thr Ile Ala Ser Lys Val Ser Leu
                245                 250                 255

Gly Ala Val Tyr Phe Phe Met Asn Gly Thr Tyr Gly Leu Ala Phe Trp
            260                 265                 270

Tyr Gly Thr Ser Leu Ile Leu Asn Gly Glu Pro Gly Tyr Thr Ile Gly
        275                 280                 285

Thr Val Leu Ala Val Phe Phe Ser Val Ile His Ser Ser Tyr Cys Ile
    290                 295                 300

Gly Ala Ala Val Pro His Phe Glu Thr Phe Ala Ile Ala Arg Gly Ala
305                 310                 315                 320

Ala Phe His Ile Phe Gln Val Ile Asp Lys Lys Pro Ser Ile Asp Asn
                325                 330                 335

Phe Ser Thr Ala Gly Tyr Lys Pro Glu Ser Ile Glu Gly Thr Val Glu
            340                 345                 350

Phe Lys Asn Val Ser Phe Asn Tyr Pro Ser Arg Pro Ser Ile Lys Ile
        355                 360                 365

Leu Lys Gly Leu Asn Leu Arg Ile Lys Ser Gly Glu Thr Val Ala Leu
    370                 375                 380

Val Gly Leu Asn Gly Ser Gly Lys Ser Thr Val Val Gln Leu Leu Gln
385                 390                 395                 400

Arg Leu Tyr Asp Pro Asp Asp Gly Phe Ile Met Val Asp Glu Asn Asp
                405                 410                 415

Ile Arg Ala Leu Asn Val Arg His Tyr Arg Asp His Ile Gly Val Val
            420                 425                 430

Ser Gln Glu Pro Val Leu Phe Gly Thr Thr Ile Ser Asn Asn Ile Lys
        435                 440                 445

Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu Met Glu Arg Ala Ala Arg
    450                 455                 460
```

```
Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu Phe Pro Asn Lys Phe Asn
465                 470                 475                 480

Thr Leu Val Gly Glu Lys Gly Ala Gln Met Ser Gly Gly Gln Lys Gln
                485                 490                 495

Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Ile
            500                 505                 510

Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser Glu Ser Lys Ser Ala Val
        515                 520                 525

Gln Ala Ala Leu Glu Lys Ala Ser Lys Gly Arg Thr Thr Ile Val Val
    530                 535                 540

Ala His Arg Leu Ser Thr Ile Arg Ser Ala Asp Leu Ile Val Thr Leu
545                 550                 555                 560

Lys Asp Gly Met Leu Ala Glu Lys Gly Ala His Ala Glu Leu Met Ala
                565                 570                 575

Lys Arg Gly Leu Tyr Tyr Ser Leu Val Met Ser Gln Asp Ile Lys Lys
            580                 585                 590

Ala Asp Glu Gln Met Glu Ser Met Thr Tyr Ser Thr Glu Arg Lys Thr
        595                 600                 605

Asn Ser Leu Pro Leu His Ser Val Lys Ser Ile Lys Ser Asp Phe Ile
    610                 615                 620

Asp Lys Ala Glu Glu Ser Thr Gln Ser Lys Glu Ile Ser Leu Pro Glu
625                 630                 635                 640

Val Ser Leu Leu Lys Ile Leu Lys Leu Asn Lys Pro Glu Trp Pro Phe
                645                 650                 655

Val Val Leu Gly Thr Leu Ala Ser Val Leu Asn Gly Thr Val His Pro
            660                 665                 670

Val Phe Ser Ile Ile Phe Ala Lys Ile Ile Thr Met Phe Gly Asn Asn
        675                 680                 685

Asp Lys Thr Thr Leu Lys His Asp Ala Glu Ile Tyr Ser Met Ile Phe
    690                 695                 700

Val Ile Leu Gly Val Ile Cys Phe Val Ser Tyr Phe Met Gln Gly Leu
705                 710                 715                 720

Phe Tyr Gly Arg Ala Gly Glu Ile Leu Thr Met Arg Leu Arg His Leu
                725                 730                 735

Ala Phe Lys Ala Met Leu Tyr Gln Asp Ile Ala Trp Phe Asp Glu Lys
            740                 745                 750

Glu Asn Ser Thr Gly Gly Leu Thr Thr Ile Leu Ala Ile Asp Ile Ala
        755                 760                 765

Gln Ile Gln Gly Ala Thr Gly Ser Arg Ile Gly Val Leu Thr Gln Asn
    770                 775                 780

Ala Thr Asn Met Gly Leu Ser Val Ile Ile Ser Phe Ile Tyr Gly Trp
785                 790                 795                 800
```

```
Glu Met Thr Phe Leu Ile Leu Ser Ile Ala Pro Val Leu Ala Val Thr
                805                 810                 815

Gly Met Ile Glu Thr Ala Ala Met Thr Gly Phe Ala Asn Lys Asp Lys
            820                 825                 830

Gln Glu Leu Lys His Ala Gly Lys Ile Ala Thr Glu Ala Leu Glu Asn
        835                 840                 845

Ile Arg Thr Ile Val Ser Leu Thr Arg Glu Lys Ala Phe Glu Gln Met
    850                 855                 860

Tyr Glu Glu Met Leu Gln Thr Gln His Arg Asn Thr Ser Lys Lys Ala
865                 870                 875                 880

Gln Ile Ile Gly Ser Cys Tyr Ala Phe Ser His Ala Phe Ile Tyr Phe
                885                 890                 895

Ala Tyr Ala Ala Gly Phe Arg Phe Gly Ala Tyr Leu Ile Gln Ala Gly
            900                 905                 910

Arg Met Thr Pro Glu Gly Met Phe Ile Val Phe Thr Ala Ile Ala Tyr
        915                 920                 925

Gly Ala Met Ala Ile Gly Lys Thr Leu Val Leu Ala Pro Glu Tyr Ser
    930                 935                 940

Lys Ala Lys Ser Gly Ala Ala His Leu Phe Ala Leu Leu Glu Lys Lys
945                 950                 955                 960

Pro Asn Ile Asp Ser Arg Ser Gln Glu Gly Lys Lys Pro Asp Thr Cys
                965                 970                 975

Glu Gly Asn Leu Glu Phe Arg Glu Val Ser Phe Phe Tyr Pro Cys Arg
            980                 985                 990

Pro Asp Val Phe Ile Leu Arg Gly  Leu Ser Leu Ser Ile  Glu Arg Gly
        995                 1000                1005

Lys Thr  Val Ala Phe Val Gly  Ser Ser Gly Cys Gly  Lys Ser Thr
    1010                1015                1020

Ser Val  Gln Leu Leu Gln Arg  Leu Tyr Asp Pro Val  Gln Gly Gln
    1025                1030                1035

Val Leu  Phe Asp Gly Val Asp  Ala Lys Glu Leu Asn  Val Gln Trp
    1040                1045                1050

Leu Arg  Ser Gln Ile Ala Ile  Val Pro Gln Glu Pro  Val Leu Phe
    1055                1060                1065

Asn Cys  Ser Ile Ala Glu Asn  Ile Ala Tyr Gly Asp  Asn Ser Arg
    1070                1075                1080

Val Val  Pro Leu Asp Glu Ile  Lys Glu Ala Ala Asn  Ala Ala Asn
    1085                1090                1095

Ile His  Ser Phe Ile Glu Gly  Leu Pro Glu Lys Tyr  Asn Thr Gln
    1100                1105                1110

Val Gly  Leu Lys Gly Ala Gln  Leu Ser Gly Gly Gln  Lys Gln Arg
    1115                1120                1125
```

Leu Ala Ile Ala Arg Ala Leu Leu Gln Lys Pro Lys Ile Leu Leu
1130 1135 1140

Leu Asp Glu Ala Thr Ser Ala Leu Asp Asn Asp Ser Glu Lys Val
1145 1150 1155

Val Gln His Ala Leu Asp Lys Ala Arg Thr Gly Arg Thr Cys Leu
1160 1165 1170

Val Val Thr His Arg Leu Ser Ala Ile Gln Asn Ala Asp Leu Ile
1175 1180 1185

Val Val Leu His Asn Gly Lys Ile Lys Glu Gln Gly Thr His Gln
1190 1195 1200

Glu Leu Leu Arg Asn Arg Asp Ile Tyr Phe Lys Leu Val Asn Ala
1205 1210 1215

Gln Ser Val Gln
1220

<210> 6

<211> 1195

<212> PRT

<213> Homo sapiens

<400> 6

Met Ile Leu Gly Ile Leu Ala Ser Leu Val Asn Gly Ala Cys Leu Pro
1 5 10 15

Leu Met Pro Leu Val Leu Gly Glu Met Ser Asp Asn Leu Ile Ser Gly
20 25 30

Cys Leu Val Gln Thr Asn Thr Tyr Ser Phe Phe Arg Leu Thr Leu Tyr
35 40 45

Tyr Val Gly Ile Gly Val Ala Ala Leu Ile Phe Gly Tyr Ile Gln Ile
50 55 60

Ser Leu Trp Ile Ile Thr Ala Ala Arg Gln Thr Lys Arg Ile Arg Lys
65 70 75 80

Gln Phe Phe His Ser Val Leu Ala Gln Asp Ile Gly Trp Phe Asp Ser
85 90 95

Cys Asp Ile Gly Glu Leu Asn Thr Arg Met Thr Asp Ile Asp Lys Ile
100 105 110

Ser Asp Gly Ile Gly Asp Lys Ile Ala Leu Leu Phe Gln Asn Met Ser
115 120 125

Thr Phe Ser Ile Gly Leu Ala Val Gly Leu Val Lys Gly Trp Lys Leu
130 135 140

Thr Leu Val Thr Leu Ser Thr Ser Pro Leu Ile Met Ala Ser Ala Ala
145 150 155 160

Ala Cys Ser Arg Met Val Ile Ser Leu Thr Ser Lys Glu Leu Ser Ala
165 170 175

Tyr Ser Lys Ala Gly Ala Val Ala Glu Glu Val Leu Ser Ser Ile Arg
180 185 190

Thr Val Ile Ala Phe Arg Ala Gln Glu Lys Glu Leu Gln Arg Tyr Thr
195 200 205

Gln Asn Leu Lys Asp Ala Lys Asp Phe Gly Ile Lys Arg Thr Ile Ala
210 215 220

Ser Lys Val Ser Leu Gly Ala Val Tyr Phe Phe Met Asn Gly Thr Tyr
225 230 235 240

Gly Leu Ala Phe Trp Tyr Gly Thr Ser Leu Ile Leu Asn Gly Glu Pro
245 250 255

Gly Tyr Thr Ile Gly Thr Val Leu Ala Val Phe Phe Ser Val Ile His
260 265 270

Ser Ser Tyr Cys Ile Gly Ala Ala Val Pro His Phe Glu Thr Phe Ala
275 280 285

Ile Ala Arg Gly Ala Ala Phe His Ile Phe Gln Val Ile Asp Lys Lys
290 295 300

Pro Ser Ile Asp Asn Phe Ser Thr Ala Gly Tyr Lys Pro Glu Ser Ile
305 310 315 320

Glu Gly Thr Val Glu Phe Lys Asn Val Ser Phe Asn Tyr Pro Ser Arg
325 330 335

Pro Ser Ile Lys Ile Leu Lys Gly Leu Asn Leu Arg Ile Lys Ser Gly
340 345 350

Glu Thr Val Ala Leu Val Gly Leu Asn Gly Ser Gly Lys Ser Thr Val
355 360 365

Val Gln Leu Leu Gln Arg Leu Tyr Asp Pro Asp Asp Gly Phe Ile Met
370 375 380

Val Asp Glu Asn Asp Ile Arg Ala Leu Asn Val Arg His Tyr Arg Asp
385 390 395 400

His Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Gly Thr Thr Ile
405 410 415

Ser Asn Asn Ile Lys Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu Met
420 425 430

Glu Arg Ala Ala Arg Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu Phe
435 440 445

Pro Asn Lys Phe Asn Thr Leu Val Gly Glu Lys Gly Ala Gln Met Ser
450 455 460

Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Asn
465 470 475 480

Pro Lys Ile Leu Ile Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser Glu
485 490 495

Ser Lys Ser Ala Val Gln Ala Ala Leu Glu Lys Ala Ser Lys Gly Arg
500 505 510

Thr Thr Ile Val Val Ala His Arg Leu Ser Thr Ile Arg Ser Ala Asp
515 520 525

Leu Ile Val Thr Leu Lys Asp Gly Met Leu Ala Glu Lys Gly Ala His
530 535 540

Ala Glu Leu Met Ala Lys Arg Gly Leu Tyr Tyr Ser Leu Val Met Ser
545 550 555 560

Gln Asp Ile Lys Lys Ala Asp Glu Gln Met Glu Ser Met Thr Tyr Ser
565 570 575

Thr Glu Arg Lys Thr Asn Ser Leu Pro Leu His Ser Val Lys Ser Ile
580 585 590

Lys Ser Asp Phe Ile Asp Lys Ala Glu Glu Ser Thr Gln Ser Lys Glu
595 600 605

Ile Ser Leu Pro Glu Val Ser Leu Leu Lys Ile Leu Lys Leu Asn Lys
610 615 620

Pro Glu Trp Pro Phe Val Val Leu Gly Thr Leu Ala Ser Val Leu Asn
625 630 635 640

Gly Thr Val His Pro Val Phe Ser Ile Ile Phe Ala Lys Ile Ile Thr
645 650 655

Met Phe Gly Asn Asn Asp Lys Thr Thr Leu Lys His Asp Ala Glu Ile
660 665 670

Tyr Ser Met Ile Phe Val Ile Leu Gly Val Ile Cys Phe Val Ser Tyr
675 680 685

Phe Met Gln Gly Leu Phe Tyr Gly Arg Ala Gly Glu Ile Leu Thr Met
690 695 700

Arg Leu Arg His Leu Ala Phe Lys Ala Met Leu Tyr Gln Asp Ile Ala
705 710 715 720

Trp Phe Asp Glu Lys Glu Asn Ser Thr Gly Gly Leu Thr Thr Ile Leu
725 730 735

Ala Ile Asp Ile Ala Gln Ile Gln Gly Ala Thr Gly Ser Arg Ile Gly
740 745 750

Val Leu Thr Gln Asn Ala Thr Asn Met Gly Leu Ser Val Ile Ile Ser
755 760 765

Phe Ile Tyr Gly Trp Glu Met Thr Phe Leu Ile Leu Ser Ile Ala Pro
770 775 780

Val Leu Ala Val Thr Gly Met Ile Glu Thr Ala Ala Met Thr Gly Phe
785 790 795 800

Ala Asn Lys Asp Lys Gln Glu Leu Lys His Ala Gly Lys Ile Ala Thr
805 810 815

Glu Ala Leu Glu Asn Ile Arg Thr Ile Val Ser Leu Thr Arg Glu Lys
820 825 830

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Ala Phe Glu Gln Met Tyr Glu Glu Met Leu Gln Thr Gln His Arg Asn
        835                 840                 845

Thr Ser Lys Lys Ala Gln Ile Ile Gly Ser Cys Tyr Ala Phe Ser His
    850                 855                 860

Ala Phe Ile Tyr Phe Ala Tyr Ala Ala Gly Phe Arg Phe Gly Ala Tyr
865                 870                 875                 880

Leu Ile Gln Ala Gly Arg Met Thr Pro Glu Gly Met Phe Ile Val Phe
                885                 890                 895

Thr Ala Ile Ala Tyr Gly Ala Met Ala Ile Gly Lys Thr Leu Val Leu
            900                 905                 910

Ala Pro Glu Tyr Ser Lys Ala Lys Ser Gly Ala Ala His Leu Phe Ala
        915                 920                 925

Leu Leu Glu Lys Lys Pro Asn Ile Asp Ser Arg Ser Gln Glu Gly Lys
    930                 935                 940

Lys Pro Asp Thr Cys Glu Gly Asn Leu Glu Phe Arg Glu Val Ser Phe
945                 950                 955                 960

Phe Tyr Pro Cys Arg Pro Asp Val Phe Ile Leu Arg Gly Leu Ser Leu
                965                 970                 975

Ser Ile Glu Arg Gly Lys Thr Val Ala Phe Val Gly Ser Ser Gly Cys
            980                 985                 990

Gly Lys Ser Thr Ser Val Gln Leu  Leu Gln Arg Leu Tyr  Asp Pro Val
        995                 1000                1005

Gln Gly  Gln Val Leu Phe Asp  Gly Val Asp Ala Lys  Glu Leu Asn
    1010                1015                1020

Val Gln  Trp Leu Arg Ser Gln  Ile Ala Ile Val Pro  Gln Glu Pro
    1025                1030                1035

Val Leu  Phe Asn Cys Ser Ile  Ala Glu Asn Ile Ala  Tyr Gly Asp
    1040                1045                1050

Asn Ser  Arg Val Val Pro Leu  Asp Glu Ile Lys Glu  Ala Ala Asn
    1055                1060                1065

Ala Ala  Asn Ile His Ser Phe  Ile Glu Gly Leu Pro  Glu Lys Tyr
    1070                1075                1080

Asn Thr  Gln Val Gly Leu Lys  Gly Ala Gln Leu Ser  Gly Gly Gln
    1085                1090                1095

Lys Gln  Arg Leu Ala Ile Ala  Arg Ala Leu Leu Gln  Lys Pro Lys
    1100                1105                1110

Ile Leu  Leu Leu Asp Glu Ala  Thr Ser Ala Leu Asp  Asn Asp Ser
    1115                1120                1125

Glu Lys  Val Val Gln His Ala  Leu Asp Lys Ala Arg  Thr Gly Arg
    1130                1135                1140

Thr Cys  Leu Val Val Thr His  Arg Leu Ser Ala Ile  Gln Asn Ala
    1145                1150                1155
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Asp Leu Ile Val Val Leu His Asn Gly Lys Ile Lys Glu Gln Gly
1160 1165 1170

Thr His Gln Glu Leu Leu Arg Asn Arg Asp Ile Tyr Phe Lys Leu
1175 1180 1185

Val Asn Ala Gln Ser Val Gln
1190 1195

<210> 7

<211> 541

<212> PRT

<213> Homo sapiens

<220>

<221> Note

<222> (230)..(230)

<223> Xaa at position 230 represents any L amino acid

<400> 7

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Leu Met Pro Leu Val Leu Gly Glu Met Ser Asp Asn Leu Ile Ser Gly
20 25 30

Cys Leu Val Gln Thr Asn Thr Tyr Ser Phe Phe Arg Leu Thr Leu Tyr
35 40 45

Tyr Val Gly Ile Gly Val Ala Ala Leu Ile Phe Gly Tyr Ile Gln Ile
50 55 60

Ser Leu Trp Ile Ile Thr Ala Ala Arg Gln Thr Lys Arg Ile Arg Lys
65 70 75 80

Gln Phe Phe His Ser Val Leu Ala Gln Asp Ile Gly Trp Phe Asp Ser
85 90 95

Cys Asp Ile Gly Glu Leu Asn Thr Arg Met Thr Asp Ile Asp Lys Ile
100 105 110

Ser Asp Gly Ile Gly Asp Lys Ile Ala Leu Leu Phe Gln Asn Met Ser
115 120 125

Thr Phe Ser Ile Gly Leu Ala Val Gly Leu Val Lys Gly Trp Lys Leu
130 135 140

Thr Leu Val Thr Leu Ser Thr Ser Pro Leu Ile Met Ala Ser Ala Ala
145 150 155 160

Ala Cys Ser Arg Met Val Ile Ser Leu Thr Ser Lys Glu Leu Ser Ala
165 170 175

Tyr Ser Lys Ala Gly Ala Val Ala Glu Glu Val Leu Ser Ser Ile Arg
            180   185   190

Thr Val Ile Ala Phe Arg Ala Gln Glu Lys Glu Leu Gln Arg Ser Phe
        195   200   205

Leu Leu Asn Ile Thr Arg Tyr Ala Trp Phe Tyr Phe Pro Gln Trp Leu
    210   215   220

Leu Ser Cys Val Leu Xaa Phe Val Arg Tyr Thr Gln Asn Leu Lys Asp
225   230   235   240

Ala Lys Asp Phe Gly Ile Lys Arg Thr Ile Ala Ser Lys Val Ser Leu
                245   250   255

Gly Ala Val Tyr Phe Phe Met Asn Gly Thr Tyr Gly Leu Ala Phe Trp
            260   265   270

Tyr Gly Thr Ser Leu Ile Leu Asn Gly Glu Pro Gly Tyr Thr Ile Gly
        275   280   285

Thr Val Leu Ala Val Phe Phe Ser Val Ile His Ser Ser Tyr Cys Ile
    290   295   300

Gly Ala Ala Val Pro His Phe Glu Thr Phe Ala Ile Ala Arg Gly Ala
305   310   315   320

Ala Phe His Ile Phe Gln Val Ile Asp Lys Lys Pro Ser Ile Asp Asn
                325   330   335

Phe Ser Thr Ala Gly Tyr Lys Pro Glu Ser Ile Glu Gly Thr Val Glu
            340   345   350

Phe Lys Asn Val Ser Phe Asn Tyr Pro Ser Arg Pro Ser Ile Lys Ile
        355   360   365

Leu Lys Gly Leu Asn Leu Arg Ile Lys Ser Gly Glu Thr Val Ala Leu
    370   375   380

Val Gly Leu Asn Gly Ser Gly Lys Ser Thr Val Val Gln Leu Leu Gln
385   390   395   400

Arg Leu Tyr Asp Pro Asp Asp Gly Phe Ile Met Val Asp Glu Asn Asp
                405   410   415

Ile Arg Ala Leu Asn Val Arg His Tyr Arg Asp His Ile Gly Val Val
            420   425   430

Ser Gln Glu Pro Val Leu Phe Gly Thr Thr Ile Ser Asn Asn Ile Lys
        435   440   445

Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu Met Glu Arg Ala Ala Arg
    450   455   460

Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu Phe Pro Asn Lys Phe Asn
465   470   475   480

Thr Leu Val Gly Glu Lys Gly Ala Gln Met Ser Gly Gly Gln Lys Gln
                485   490   495

Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Ile
            500   505   510

Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser Glu Ser Lys Ser Ala Val
515 520 525

Gln Ala Ala Leu Glu Lys Asp Thr Pro Arg Tyr Ser Phe
530 535 540

<210> 8

<211> 514

<212> PRT

<213> Homo sapiens

<400> 8

Met Ile Leu Gly Ile Leu Ala Ser Leu Val Asn Gly Ala Cys Leu Pro
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Leu Met Pro Leu Val Leu Gly Glu Met Ser Asp Asn Leu Ile Ser Gly
20 25 30

Cys Leu Val Gln Thr Asn Thr Tyr Ser Phe Phe Arg Leu Thr Leu Tyr
35 40 45

Tyr Val Gly Ile Gly Val Ala Ala Leu Ile Phe Gly Tyr Ile Gln Ile
50 55 60

Ser Leu Trp Ile Ile Thr Ala Ala Arg Gln Thr Lys Arg Ile Arg Lys
65 70 75 80

Gln Phe Phe His Ser Val Leu Ala Gln Asp Ile Gly Trp Phe Asp Ser
85 90 95

Cys Asp Ile Gly Glu Leu Asn Thr Arg Met Thr Asp Ile Asp Lys Ile
100 105 110

Ser Asp Gly Ile Gly Asp Lys Ile Ala Leu Leu Phe Gln Asn Met Ser
115 120 125

Thr Phe Ser Ile Gly Leu Ala Val Gly Leu Val Lys Gly Trp Lys Leu
130 135 140

Thr Leu Val Thr Leu Ser Thr Ser Pro Leu Ile Met Ala Ser Ala Ala
145 150 155 160

Ala Cys Ser Arg Met Val Ile Ser Leu Thr Ser Lys Glu Leu Ser Ala
165 170 175

Tyr Ser Lys Ala Gly Ala Val Ala Glu Glu Val Leu Ser Ser Ile Arg
180 185 190

Thr Val Ile Ala Phe Arg Ala Gln Glu Lys Glu Leu Gln Arg Tyr Thr
195 200 205

Gln Asn Leu Lys Asp Ala Lys Asp Phe Gly Ile Lys Arg Thr Ile Ala
210 215 220

Ser Lys Val Ser Leu Gly Ala Val Tyr Phe Phe Met Asn Gly Thr Tyr
225 230 235 240

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Gly Leu Ala Phe Trp Tyr Gly Thr Ser Leu Ile Leu Asn Gly Glu Pro
                245                 250                 255

Gly Tyr Thr Ile Gly Thr Val Leu Ala Val Phe Phe Ser Val Ile His
            260                 265                 270

Ser Ser Tyr Cys Ile Gly Ala Ala Val Pro His Phe Glu Thr Phe Ala
        275                 280                 285

Ile Ala Arg Gly Ala Ala Phe His Ile Phe Gln Val Ile Asp Lys Lys
    290                 295                 300

Pro Ser Ile Asp Asn Phe Ser Thr Ala Gly Tyr Lys Pro Glu Ser Ile
305                 310                 315                 320

Glu Gly Thr Val Glu Phe Lys Asn Val Ser Phe Asn Tyr Pro Ser Arg
                325                 330                 335

Pro Ser Ile Lys Ile Leu Lys Gly Leu Asn Leu Arg Ile Lys Ser Gly
            340                 345                 350

Glu Thr Val Ala Leu Val Gly Leu Asn Gly Ser Gly Lys Ser Thr Val
        355                 360                 365

Val Gln Leu Leu Gln Arg Leu Tyr Asp Pro Asp Asp Gly Phe Ile Met
    370                 375                 380

Val Asp Glu Asn Asp Ile Arg Ala Leu Asn Val Arg His Tyr Arg Asp
385                 390                 395                 400

His Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Gly Thr Thr Ile
                405                 410                 415

Ser Asn Asn Ile Lys Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu Met
            420                 425                 430

Glu Arg Ala Ala Arg Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu Phe
        435                 440                 445

Pro Asn Lys Phe Asn Thr Leu Val Gly Glu Lys Gly Ala Gln Met Ser
    450                 455                 460

Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Asn
465                 470                 475                 480

Pro Lys Ile Leu Ile Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser Glu
                485                 490                 495

Ser Lys Ser Ala Val Gln Ala Ala Leu Glu Lys Asp Thr Pro Arg Tyr
            500                 505                 510

Ser Phe
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<210> 9

<211> 2066

<212> DNA

<213> Homo sapiens

<400> 9

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tggcaaaacg aggtctatat tattcacttg tgatgtcaca ggatattaaa aaagctgatg 180
aacagatgga gtcaatgaca tattctactg aaagaaagac caactcactt cctctgcact 240
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gttccaggat tggcgtctta acacaaaatg caactaacat gggactttca gttatcattt 780
cctttatata tggatgggag atgacattcc tgattctgag tattgctcca gtacttgccg 840
tgacaggaat gattgaaacc gcagcaatga ctggatttgc caacaaagat aagcaagaac 900
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attttgccta tgcagcaggg tttcgatttg gagcctattt aattcaagct ggacgaatga 1140
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ttctccaaaa acccaaaatt ttattgttgg atgaggccac ttcagccctc gataatgaca 1860
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gtgagaaggt ggttcagcat gcccttgata aagccaggac gggaaggaca tgcctagtgg 1920

tcactcacag gctctctgca attcagaacg cagatttgat agtggttctg cacaatggaa 1980

agataaagga acaaggaact catcaagagc tcctgagaaa tcgagacata tattttaagt 2040

tagtgaatgc acagtcagtg cagtga 2066

<210> 10

<211> 2856

<212> DNA

<213> Homo sapiens

<400> 10

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gaatttaaaa atgtttcttt caattatcca tcaagaccat ctatcaagat tctgaaaggt 300

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aagagtacgg tagtccagct tctgcagagg ttatatgatc cggatgatgg ctttatcatg 420

gtggatgaga atgacatcag agctttaaat gtgcggcatt atcgagacca tattggagtg 480

gttagtcaag agcctgtttt gttcgggacc accatcagta acaatatcaa gtatggacga 540

gatgatgtga ctgatgaaga gatggagaga gcagcaaggg aagcaaatgc gtatgatttt 600

atcatggagt ttcctaataa atttaataca ttggtagggg aaaaaggagc tcaaatgagt 660

ggagggcaga aacagaggat cgcaattgct cgtgccttag ttcgaaaccc caagattctg 720

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ctggagaagg cgagcaaagg tcggactaca atcgtggtag cacaccgact ttctactatt 840

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gctgaactaa tggcaaaacg aggtctatat tattcacttg tgatgtcaca ggatattaaa 960

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aagcaagaac ttaagcatgc tggaaagata gcaactgaag ctttggagaa tatacgtact 1740

atagtgtcat taacaaggga aaaagccttc gagcaaatgt atgaagagat gcttcagact 1800

caacacagaa atacctcgaa gaaagcacag attattggaa gctgttatgc attcagccat 1860

gcctttatat attttgccta tgcagcaggg tttcgatttg gagcctattt aattcaagct 1920

ggacgaatga ccccagaggg catgttcata gtttttactg caattgcata tggagctatg 1980

gccatcggaa aaacgctcgt tttggctcct gaatattcca aagccaaatc gggggctgcg 2040

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tgcctagtgg tcactcacag gctctctgca attcagaacg cagatttgat agtggttctg 2760

cacaatggaa agataaagga acaaggaact catcaagagc tcctgagaaa tcgagacata 2820

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<210> 11

<211> 1175

<212> DNA

<213> Homo sapiens

<400> 11

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cccagtatag ataacttttc cacagctgga tataaacctg aatccataga aggaactgtg 240

gaatttaaaa atgtttcttt caattatcca tcaagaccat ctatcaagat tctgaaaggt 300

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aagagtacgg tagtccagct tctgcagagg ttatatgatc cggatgatgg ctttatcatg 420

gtggatgaga atgacatcag agctttaaat gtgcggcatt atcgagacca tattggagtg 480

gttagtcaag agcctgtttt gttcgggacc accatcagta acaatatcaa gtatggacga 540

gatgatgtga ctgatgaaga gatggagaga gcagcaaggg aagcaaatgc gtatgatttt 600

atcatggagt ttcctaataa atttaataca ttggtagggg aaaaaggagc tcaaatgagt 660

ggagggcaga aacagaggat cgcaattgct cgtgccttag ttcgaaaccc caagattctg 720

attttagatg aggctacgtc tgccctggat tcagaaagca agtcagctgt tcaagctgca 780

ctggagaagg ataccccccag gtattcattt tgacctaatt tcacctcaag tggagaatcg 840

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ctcgatggcc tgactcccctt ataaaccaga gccttcagac cccttacaag gcttaatggc 1080

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gcaggcttct ttttttaaaa tgctgacttt atgga 1175

<210> 12

<211> 3177

<212> DNA

<213> Homo sapiens

<220>

<221> Note

<222> (198)..(198)

<223> n at position 198 represents any nucleotide (A, T, C or G)

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